

(4)

6. (a) Explain the concept of U-spin and V-spin and discuss the SU(3) quark model.

Or

- (b) Write a note on Baryon Decouplets and discuss the Baryon-Meson coupling.

Total Pages—4

M.Sc.—Phy-IVS(CC-402)

2019

Time : 3 hours

Full Marks : 80

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(ELEMENTARY PARTICLE PHYSICS)

SECTION – A

1. Answer any *four* of the following : 4 × 4
- (a) Explain the history of elementary particles.
 - (b) Give the classification of Mesons.
 - (c) Explain the associated production of strange particles.
 - (d) Briefly explain the parity in quantum mechanics.

(2)

- (e) Explain the test of charge conjugation.
(f) Write a note on SU(2) symmetries.

Or

2. Answer *all* questions : 2 × 8
- (a) Define Baryon number.
(b) What is strangeness quantum number ?
(c) Define isospin.
(d) What do you mean by test for isospin ?
(e) Define discrete symmetry.
(f) Define time reversal.
(g) Define the concept of I-spin.
(h) What do you mean the eight-fold way.

SECTION – B

Answer *all* questions : 16 × 4

3. (a) Explain the classification of Leptons and Mesons and discuss the interactions among them.

(3)

Or

- (b) Explain in detail the classification of photons and quarks and write a note on color quantum number.

4. (a) Explain the charge independence of nuclear forces and discuss the test for isospin conservation.

Or

- (b) Obtain Gell-Mann Nishijima scheme and explain the conservation laws in relation to particle reactions.

5. (a) Explain test of parity and test of time reversal and discuss the time reversal in Field Theories.

Or

- (b) Explain the additive quantum number and discuss the CPT theorem and its consequences.